

# NEW TERMITES FROM INDIA

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Recently, Cedric Dover, of the Forest Research Institute, Dehra Dun, United Provinces, India, gave me the opportunity of examining a small collection of termites from India. The present paper is based on this material together with a few other termites which had previously been sent to me by other officials at Dehra Dun. In it hitherto unknown castes, as well as new species, are described.

The Indomalayan termite fauna shows the greatest affinity with that of the Ethiopian region; the next closest affinity is with the neotropical region. Next to the Ethiopian, the Indomalayan region has the greatest number of genera and subgenera, but next to the Ethiopian, the neotropical region has the greatest number of species.

Table 1 presents a comparison of the known termite fauna of India and of Ceylon and shows that the family Kalotermitidae is but poorly represented in India. This difference is regarded as more apparent than real, and more collecting of these less conspicuous termites will undoubtedly reveal new species. The termites that build mounds and carton-tree or ground nests always receive first attention.

TABLE 1.—Comparison of known termite fauna of India and of Ceylon

Classification	Termites of India	Termites of Ceylon
Families.....	4	3
Genera.....	16	14
Subgenera.....	18	16
Species:		
Hodotermitidae.....	2	0
Kalotermitidae.....	5	<sup>1</sup> 14
Rhinotermitidae.....	7	<sup>1</sup> 5
Termitidae.....	59	40
Total.....	<sup>2</sup> 73	59

<sup>1</sup> Includes species not yet described.

<sup>2</sup> 11 occur also in Ceylon.

Eleven new termites are described in this paper: Three in the family Kalotermitidae, one in the family Rhinotermitidae, and seven in the family Termitidae, making a total of 84 species for India.

Drawings for the figures in this paper were made by H. B. Bradford, of the United States Bureau of Entomology.

### Family KALOTERMITIDAE

#### KALOTERMES (NEOTERMES) ANDAMANENSIS, new species

*Description*.—Dealated adult: Head castaneous-brown, with fairly dense long bristles; V-shaped marking on epicranial suture. Eyes black, large, close to lateral margin of head. Ocellus white, large, obliquely touching eye. Antennae (broken ?) with 11 segments, third segment shorter than second but longer than fourth. Pronotum slightly lighter colored than head, with long bristles, anterior margin shallowly concave, posterior margin slightly emarginate. Pulvillus between claws. Abdomen with tergites yellow-brown and with row of bristles.

*Measurements*.—Length of dealated adult, 7.5 mm; length of head (to tip of labrum), 1.9 mm; length of pronotum, 1 mm; length of hind tibia, 1.3 mm; long diameter of eye, 0.5 mm; width of head, 1.65 mm; width of pronotum, 1.7 mm.

*Type locality*.—North Andaman Island.

*Holotype*.—Dealated female adult, tube 19, British Museum; morphotype, apterous male, Forest Research Institute, Dehra Dun, United Provinces, India.

*Remarks*.—Close to *Kaloterмес (N.) greeni* Desneux of Ceylon, but smaller and pronotum less emarginate.

Described from a single dealated female adult collected with nymphs and an apterous male at the type locality "ex unknown wood," by C. E. C. Beeson, 4 to 12, III, 30.

Apterous male reproductive adult of a yellow-brown; eye spots white and smaller than in the macropterous adult and the ocelli farther from the eyes.

#### KALOTERMES (NEOTERMES) BOSEI, new species

*Description*.—Soldier: Head light castaneous-brown, with scattered very long bristles and short hairs. Eye spot white, oval, large, its long diameter the same length as first segment of antenna. Gula very narrow at middle, about one-third as wide as width at front. Antennae with 10 segments, third segment slightly modified and darker, longer than second or fourth. Mandibles black, fairly narrow and straight, slightly incurved at apex. Left mandible with two pointed marginal teeth at apical third and two molars in basal third;

right mandible with large pointed tooth in middle and a molar near base, inner margin of apical third of mandible roughened. Pronotum with slight tinge of yellow, with long bristles, margins shallowly concave anteriorly but nearly straight posteriorly. Mesonotum and metanotum with short wing pads. Hind tibiae slightly swollen. Abdomen with a row of long bristles at base of each tergite.

*Measurements.*—Length of entire soldier, 11.5 mm; length of head with mandibles, 5.3 mm; length of head without mandibles, 3.2 mm; length of left mandible, 2.1 mm; length of pronotum, 1.2 mm; length of hind tibia, 1.6 mm; width of head, 2.4 mm; width of pronotum, 2.4 mm.

The eye spot is larger than in *Kalotermes* (*Neotermes*) *fletcheri* Holmgren or *assmuthi* Holmgren, compared with cotype material.

*Nymph of winged adults.*—Head nearly round, with large eye and small ocellus, latter separated from eye by a distance greater than its diameter, head with long bristles. Antennae with 15 segments, third longer than second or fourth. Pronotum lighter colored than head, with long bristles, shallowly concave at anterior margin, posteriorly nearly straight.

Ocellus smaller and farther from eye than in *fletcheri* and in *Kalotermes* (*Neotermes*) *greeni* Desneux.

*Measurements.*—Length of head, 2.1 mm; length of pronotum, 1 mm; length of hind tibia, 1.35 mm; long diameter of eye, 0.4 mm; width of head, 1.9 mm; width of pronotum, 2.4 mm.

*Type locality.*—Mathranwala, Dehra Dun, United Provinces, India.

*Holotype.*—Soldier, tube 14, in British Museum.

*Comorphotypes.*—Nymphs and winged adult in Forest Research Institute, Dehra Dun, United Provinces, India, and United States National Museum.

*Remarks.*—Described from one soldier collected with nymphs at the type locality by "M. Bose, 16, XI, 30, ex *Ficus* sp. (rotten)." Named in honor of the collector.

KALOTERMES (NEOTERMES) GARDNERI, new species

FIGURE 1

*Description.*—Winged adult: Head castaneous-brown, with reddish tinge, epicranial suture with a V-shaped marking, head with scattered very long bristles and shorter hairs. Eye black, not round, very large, separated from lateral margins of head by a distance less than half its diameter. Ocellus white, oval, large, obliquely touching eye. Antennae with 18 or 19 segments, third segment shorter than second, but longer than fourth. Pronotum of similar color

and with similar pubescence as head, anterior margin shallowly concave, posterior margin nearly straight. Wings hyaline, veins near costal margin brown. In fore wing costa extending to over half length of wing, subcosta with 7 branches to upper margins, median not branching till near apex of wing, cubitus indistinct except near base, running about in middle of wing, with 14 main branches to lower margin of wing; in hind wing, median vein branched or biforked near base. Pulvillus present between claws. Abdomen castaneous-brown, long bristles at base of each tergite.

The eye is larger than in *fletcheri* Holmgren, compared with cotype material; also larger than in *greeni* Desneux.

*Measurements.*—Length of entire winged adult, 16–17 mm; length of entire dealated adult, 7–9 mm; length of head (to tip of labrum), 2.3 mm; length of pronotum, 1.15 mm; length of fore wing, 14 mm; length of wing scale, 1.5 mm; length of hind tibia, 1.7 mm; long diameter of eye, 0.7 mm; width of head (at eyes),

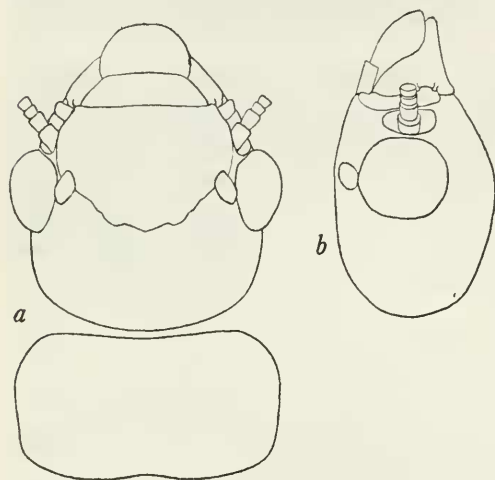


FIGURE 1.—*Kalotermes (Neotermes) gardneri*, new species: *a*, Dorsal view of head and pronotum; *b*, lateral view of head. Winged adult.  $\times 18$

1.9 mm; width of pronotum, 2.15 mm; width of fore wing, 4.5 mm.

*Type locality:* Dehra Dun, United Provinces, India.

*Cotypes.*—Winged adults, tube 10, in British Museum; Forest Research Institute, Dehra Dun; and U.S.N.M. No. 44101.

*Remarks.*—Described from a small series of winged adults collected as nymphs at the type locality and reared by J. C. M. Gardner. "No. 1107, 13, IV, 1931 ex rotten *Mangifera indica*. R. R. D. 267, B. C. R. 116, Cage 724." Named for the collector.

## Family RHINOTERMITIDAE

### HETEROTERMES MALABARICUS, new species

#### FIGURE 2

*Description.*—Winged adult: Head yellow-brown, with dense, light yellow, long bristles and shorter hairs. Fontanelle prominent, a pale, slightly raised, round spot on a line just back of eyes. Antennae yellow, usually with 14 segments, but the number ranging from 13 to 16; third segment usually shorter than second, but longer

than fourth, variable. Compound eye black, not round, separated from lateral margin of head by a distance less than its long diameter. Ocelli consistently absent. Postclypeus light yellow, bilobed, bulging, over three times as wide as long. Pronotum of same color as head, subcordate, not emarginate posteriorly but anterior margin indented in middle, with dense, long bristles and shorter hairs, not so long as wing scale (fig. 2). Mesonotum and metanotum convex, projected beyond wing scale. Wings smoky, margins ciliate, tissue punctate, hairs on surface. Median vein running nearer to middle of wing but closer to cubitus than subcosta, cubitus and branches taking up small area of wing. Abdomen with dense hairs, a row of longer bristles at base of each tergite.

Compared with cotype material of *H. indicola* and *ceylonicus* Holmgren, in cases of both winged and soldier castes: Fewer segments to antennae, and smaller eyes, which are farther from lateral margin of head than in *indicola*; closer to *ceylonicus* but fewer segments to antennae, third segment of antennae shorter than second, ocelli consistently absent, wings darker.

*Measurements*.—Length of entire winged adult, 9.5–9.75 mm; length of dealated adult, 5 mm; length of head (posterior to tip of labrum), 1.2 mm; length of pronotum, 0.5 mm; length of hind tibia, 0.9 mm; length of anterior wing, 7.55 mm; length of wing scale, 0.65 mm; width of head (at eyes), 0.8 mm; long diameter of eye, 0.2 mm; width of pronotum, 0.7 mm; width of anterior wing, 1.9 mm.

*Soldier*.—Head light yellow-brown, with scattered long bristles and shorter hairs. Antennae light yellow, 12 to 14 segments, third segment shorter than second. Gula over twice as wide at front as at narrowest point in middle. Pronotum emarginate anteriorly, nearly straight posteriorly.

In *ceylonicus*, the gula is proportionally wider at middle, and normally there are more segments to the antennae than in *malabaricus*; also the head and pronotum have sparser long bristles. In *malabaricus* the pronotum is distinct in both size and shape (fig. 2).

*Measurements*.—Length of entire soldier, 4.6 mm; length of head with mandibles, 2.4–2.5 mm; length of head without mandibles, 1.5 mm; length of left mandible, 0.9 mm; length of pronotum, 0.4 mm; length of hind tibia, 0.65 mm; width of head, 0.8–0.85 mm; width of pronotum, 0.6–0.65 mm.

*Type locality*.—S. Mangalore 400 feet, Malabar coast, Madras, India.

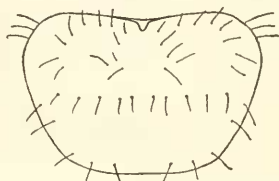


FIGURE 2.—*Heterotermes malabaricus*, new species:  
Dorsal view of pronotum  
of soldier.  $\times 45$



*Cotypes*.—Winged adults; comorphotypes, soldiers, tube 13, in British Museum; Forest Research Institute, Dehra Dun, United Provinces, India; and U.S.N.M. No. 44102.

*Remarks*.—Described from a large series of winged adults collected at the type locality with soldiers and workers, by J. C. M. Gardner, 25, V, 1930.

### Family TERMITIDAE

#### TERMES (TERMES) DEHRADUNI, new species

FIGURE 3

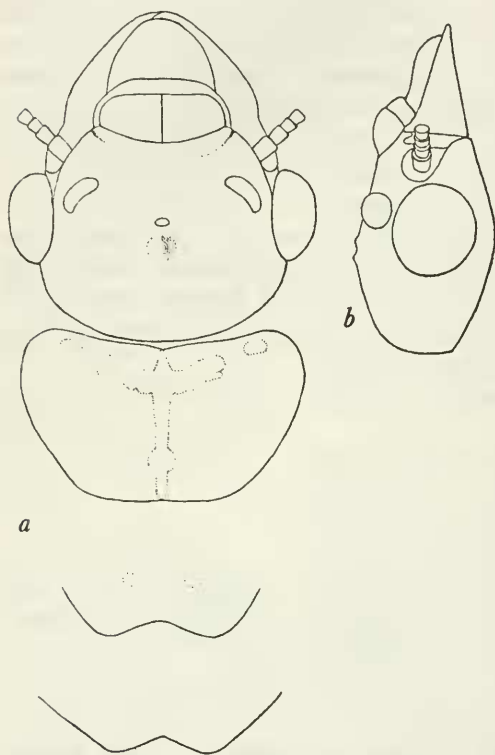


FIGURE 3.—*Termes (Termes) dehraduni*, new species: *a*, Dorsal view of head, pronotum, mesonotum, and metanotum; *b*, lateral view of head. Winged adult.  $\times 18$

*Description*.—Winged adult: Head castaneous-brown, with fairly dense short and long hairs. Fontanelle a raised conical point, in front of which is a small suboval raised spot. Postclypeus yellow-brown, projecting, bilobed, without hairs in middle, less than half its width in length. Eyes black, large, projecting, close to lower margin of head. Ocelli white, large, projecting, close to eyes. Antennae with 19 segments, third, fourth, and fifth segments subequal, second segment longer

than third. Pronotum lighter colored than head, with long hairs, anterior margin medially notched, posterior margin nearly straight. T-shaped median marking on pronotum and one ocelluslike marking on each corner anteriorly. Mesonotum and metanotum broadly and shallowly emarginate posteriorly. Wings light colored, with yellowish costal area; tissue finely punctate, not hairy, margins ciliate. In fore wing, median branching from cubitus and closer to cubitus than to subcostal vein, branched to apex; cubitus occupying most of wing area. Abdominal tergites with long hairs and a white, suboval, slanting marking on each side of each tergite.

*Measurements.*—Length of entire winged adult, 24.5–26.5 mm; length of dealated adult, 12.5–14 mm; length of head (to tip of labrum), 2.5 mm; length of pronotum, 1.2 mm; length of fore wing, 20.05–21.25 mm; length of hind tibia, 2.4 mm; long diameter of eye, 0.65 mm; width of head (at eyes), 2.3–2.4 mm; width of pronotum, 2–2.1 mm; width of fore wing, 6.75 mm.

*Type locality.*—Dehra Dun, United Provinces, India.

*Cotypes.*—Winged adults, in United States National Museum (No. 44103) and in Forest Research Institute, Dehra Dun, United Provinces.

*Remarks.*—Described from a large series of winged adults collected at the type locality by J. C. M. Gardner, 29, VI, 1925.

**TERMES (TERMES) MALABARICUS Holmgren**

FIGURE 4

*Description.*—Winged adult: Head castaneous-brown, with fairly dense short and long hairs. Fontanelle a slightly raised spot in front of which is a small white suboval spot. Postclypeus yellow-brown, projecting, medially bilobed, without hairs in middle, half its width in length. Eyes black, projecting, close to lower margin of head. Ocelli white, fairly large, projecting, separated from eyes by a distance equal to their short diameter. Antennae with 19 segments; third, fourth, and fifth segments subequal, second longer than third. Pronotum lighter colored than head, with longer hairs, anterior margin emarginate, slightly emarginate posteriorly. White “fleur de lis” median marking on pronotum and white suboval marking on each corner anteriorly. Mesonotum and metanotum broadly and shallowly emarginate posteriorly. Wings light colored, with yellowish costal area, tissue finely punctate, margins ciliate. In fore wing, median vein branching from cubitus and is closer to cubitus than to subcosta, branched to apex, cubitus occupying most of the area of the wing; subbranches of cubitus not so thick as in *T. (T.) dehraduni*. Abdomen with tergites having fairly dense long hairs and white markings similar to those in *dehraduni*.

Darker colored than *dehraduni*.

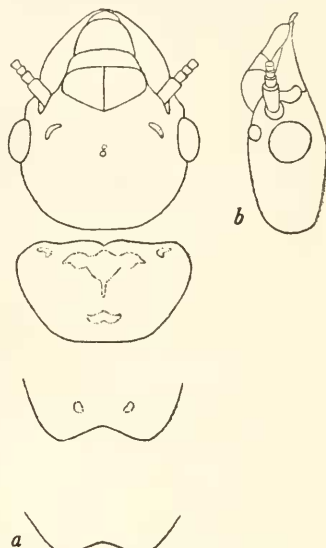


FIGURE 4.—*Termes (Termes) malabaricus* Holmgren: a, Dorsal view of head, pronotum, mesonotum, and metanotum; b, lateral view of head. Hitherto unknown winged adult.  $\times 11$

*Measurements.*—Length of entire winged adult, 22.5–23 mm; length of dealated adult, 11.5 mm; length of head (to tip of labrum), 2.55 mm; length of pronotum, 1.2 mm; length of fore wing, 19 mm; length of hind tibia, 2.4 mm; long diameter of eye, 0.5 mm; width of head (at eyes), 2.25 mm; width of pronotum, 2.1 mm; width of fore wing, 7 mm.

*Soldier.*—Head light yellow-brown, with scattered, fairly long hairs. Mandibles blackish with left mandible having small rudimentary, marginal tooth nearer to its base than to apex. Gula broad in middle. Antennae with 16 or 17 segments, second segment longer than third, third longer than fourth. Pronotum yellowish, markedly emarginate anteriorly and more broadly emarginate posteriorly, with long hairs. Abdominal tergites with long hairs.

*Measurements.*—Length of entire soldier, 5 mm; length of head with mandibles, 2.5 mm; length of head without mandibles (to anterior margin), 1.7 mm; length of pronotum, 0.6 mm; length of hind tibia, 1.1 mm; width of head, 1.3 mm; width of pronotum, 0.95 mm.

*Remarks.*—This species was based on the soldier caste, the winged adult being hitherto unknown. Described from a series of winged adults collected with soldiers and workers at Dehra Dun, United Provinces, India, 19,

VII, 1928, by J. C. M. Gardner and deposited in the United States National Museum and in the Forest Research Institute.

TERMES (CYCLOTERMES) ALMORENSIS, new species

FIGURE 5

*Description.*—Winged adult: Head castaneous-brown, with dense, long hairs. Fontanelle a small open (?) spot with ridged edges in a slightly sunken area surrounded by a lighter colored area, circular in shape and larger in diameter than an ocellus but smaller than an eye. Fontanelle not (?) elevated, with a suboval white spot in front, whole area depressed. Postclypeus yellow-brown, projecting, me-

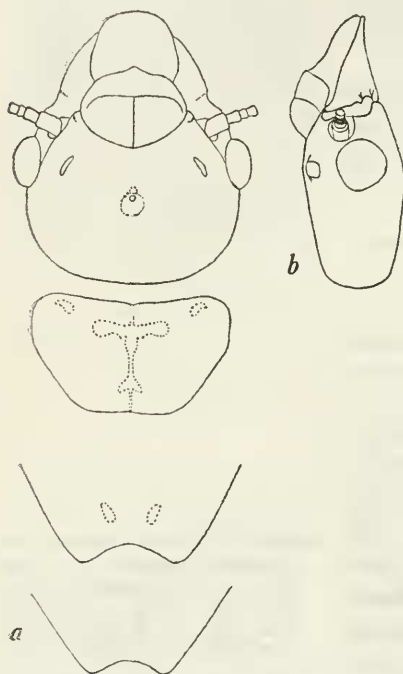


FIGURE 5.—*Termes (Cyclotermes) almorensis*, new species: *a*, Dorsal view of head, pronotum, mesonotum, and metanotum; *b*, lateral view of head.  $\times 11$



dially bilobed, without hairs in middle and not quite half its width in length. Eyes black, large, projecting, close to lower margin of head. Ocelli white, rather small (only 0.23 mm long; 0.29 mm long in *distans*) but projecting, separated from eyes by a distance equal to or longer than their long diameter. Antennae with 18 or 19 segments, third, fourth, and fifth subequal, second segment longer than third. Pronotum slightly lighter colored than head, with long hairs; anterior margin medially notched, posterior margin shallowly emarginate. A T-shaped median marking on pronotum and one ocellus-like marking on each anterior corner. Mesonotum and metanotum slightly lighter in color than pronotum, broadly and shallowly emarginate posteriorly, an ocelluslike marking on each side of mesonotum. Wings "smoky" with yellowish-brown costal area; tissue finely punctate, margins ciliate. In fore wing, median vein arising from scale free from cubitus, running close to cubitus, and branched to apex. Cubitus with 10 or 11 main subbranches to lower margin, most of which are thick. Abdominal tergites with long hairs and a white suboval slanting spot on each side of each tergite.

*Measurements*.—Length of entire winged adult, 27–29 mm; length of dealated adult, 13 mm; length of head (to tip of labrum), 2.5 mm; length of pronotum, 1.25 mm; length of fore wing, 25 mm; length of hind tibia, 2.7 mm; long diameter of eye, 0.65 mm; width of head (at eyes), 2.8 mm; width of pronotum, 2.4 mm; width of fore wing, 6.5 mm.

*Type locality*.—West Almora Forest Division, United Provinces, India.

*Cotypes*.—Winged adults, U.S.N.M. No. 44104, and in Forest Research Institute, Dehra Dun.

*Remarks*.—Close to *T. (C.) distans* Holmgren, but smaller in all measurements; compared with cotype by Dr. A. E. Emerson. Described from a large series of winged adults collected at the type locality by H. G. Champion, May, 1919, altitude 5,000 feet.

#### MICROTREMES PUBESCENS, new species

*Description*.—Soldier: Head yellowish white, narrowed anteriorly, sloping front roughened or tuberculate, with dense hairs and scattered longer bristles. Fontanelle nearer to front than to posterior margin. Gula broad. Labrum extends to a distance two-thirds the length of the mandibles, narrow elongate, tapering anteriorly, with long bristles at tip. Mandibles castaneous-brown, darker at apex, slender, curved. Antennae with 14 segments, third segment shorter than second, subequal to fourth, second not quite so long as third plus fourth, fifth longer than third. Pronotum medially deeply incised at an acute angle anteriorly, emarginate posteriorly. Forelegs with subfossorial tibiae. Abdominal tergites with hairs and a row of longer bristles at the base of each tergite.

*Measurements*.—Length of entire soldier, 3.8 mm; length of head with mandibles, 1.5 mm; length of head without mandibles (to anterior margin), 1 mm; length of left mandible, 0.6 mm; length of pronotum, 0.3 mm; length of hind tibia, 0.7 mm; width of head, 0.8 mm; width of pronotum, 0.5 mm.

*Type locality*.—Dehra Dun, United Provinces, India.

*Holotype*.—Soldier, tube 15, British Museum.

*Remarks*.—More pubescent than *obesi* Holmgren; no apical tooth as in *globoicola* Wasmann, where antennae have 16 or 15 segments; smaller than *mycophagus* Desneux, also fewer segments to antennae; pronotum anteriorly strongly medially incised, whereas weakly incised in *incertoides* Holmgren.

Described from one soldier collected with workers at the type locality by M. Bose, 31, VIII, 30, attacking aerial roots of *Ficus bengalensis*.

#### NASUTITERMES (NASUTITERMES) FLETCHERI Holmgren

*Description*.—Winged adult: Head castaneous-brown, postclypeus and antennae lighter colored. Head with dense short hairs and scattered longer bristles. Fontanelle a white narrowly oval spot with apex touching the lines outlining the epicranial suture at their convergence. Eyes black, large, projecting, very close to lateral margin of head. Ocelli large, projecting, oval, separated from eyes by a distance equal to their short diameter but less than their long diameter. Antennae with 15 segments, the second, third, and fourth segments subequal. Pronotum yellow with short hairs and longer bristles, slightly emarginate anteriorly and shallowly but broadly emarginate posteriorly. Mesonotum and metanotum broadly emarginate posteriorly. Wings grayish, margins ciliate, tissue punctate and densely hairy. In fore wing, median vein weakly defined and running close to cubitus, unbranched to apex; cubitus in middle of wing with 10 main branches to lower margin. Fore wing scale shorter than mesonotum. Abdomen with tergites brown, with dense long hairs.

*Measurements*.—Length of entire winged adult, 9 mm; length of dealated adult, 6.5 mm; length of head to tip of labrum, 1.3 mm; length of pronotum, 0.55 mm; length of fore wing, 9 mm; length of scale, 0.6 mm; length of hind tibia, 1.3 mm; long diameter of eye, 0.35 mm; width of head (at eyes), 1.2 mm; width of pronotum, 0.9 mm; width of fore wing, 2.8 mm.

*Remarks*.—*Nasutitermes* (*N.*) *fletcheri* was described by Holmgren from the soldier caste: hitherto the winged adult has been unknown. The winged adult of *N.* (*N.*) *matagensis* has a larger eye.

Described from a large series of winged adults collected with soldiers and workers at Anamalai Hills, 2,400 feet, Madras, 8, V, 1930, by J. C. M. Gardner. These soldiers appear to be identical with the cotype except that the bristles at the base of the tergites appear to be more distinct and longer than in the cotype. They were infected with a fungous disease (pl. 1).

Specimens in tube 12, Forest Research Institute, and in the United States National Museum.

**NASUTITERMES (ROTUNDITERMES) ANAMALAIENSIS, new species**

FIGURE 6

*Description.*—Soldier: Head yellowish, round, with very short hairs and with two rows of bristles; nasus reddish brown, short, cylindrical. Mandibles with a short point near base (fig. 6). An-

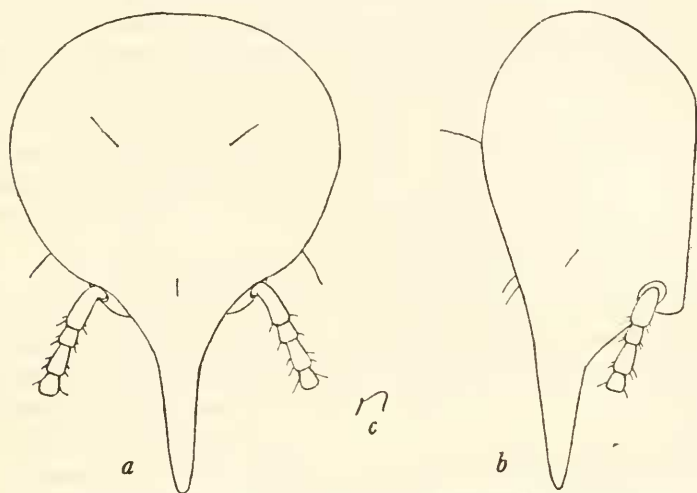


FIGURE 6.—*Nasutitermes (Rotunditermes) anamalaiensis*, new species: a, Dorsal, and b, lateral, views of head of soldier.  $\times 37$ . c, View of mandible, greatly enlarged

tennae with 12 or 13 segments, third segment always longer than the second, fourth, or fifth segments, sometimes nearly as long as fourth and fifth. Pronotum yellow, darker, and emarginate anteriorly. Abdomen dirty gray, tergites with short hairs, and a row of bristles at the base of each tergite.

*Measurements.*—Length of entire soldier, 4 mm; length of head with nasus, 1.9 mm; length of head without nasus (to anterior margin), 1.15 mm; length of nasus, 0.75 mm; length of pronotum, 0.25 mm; length of hind tibia, 1.3 mm; width of head, 1.2 mm; width of pronotum, 0.5 mm.

*Type locality.*—Anamalai Hills, 2,400 feet, Madras.

*Cotypes.*—Soldiers, tube 5, in British Museum, Forest Research Institute, Dehra Dun, United Provinces, India, and U.S.N.M. No. 44105.

*Remarks.*—Smaller than *crassicornis* Holmgren; *crassicornis* has usually one more segment to the antennae, 13 or 14, and a longer hind tibia; both are species in the subgenus *Rotunditermes*, whereas *matangensis* Haviland has a point at the apex of the mandible and is a *Nasutitermes* sensu strictu. Compared with cotypes of *crassicornis* and *matangensis*.

Described from a large series of soldiers collected with workers at the type locality by J. C. M. Gardner, 5, V, 1930.

NASUTITERMES (SUBULITERMES) GARDNERI, new species

*Description.*—Soldier: Head yellow-brown with a reddish tinge, paler posteriorly; nasus more reddish. Head and nasus in profile nearly straight, weakly concave; head not constricted back of antennae. Two long bristles on vertex of head and two shorter bristles at base of nasus. No point to the mandible. Nasus not so long as head, fairly slender, and more cylindrical than conical. Antennae with 13 segments, third segment nearly twice as long as second, second longer than fourth. Pronotum yellowish white, darker anteriorly, notched medially anteriorly and very shallowly emarginate posteriorly. Pronotum with short hairs and longer bristles on margins. Abdomen pale yellowish white; tergites with a row of long bristles at base and shorter hairs.

Distinct, because of the 13-segmented antennae.

*Measurements.*—Length of entire soldier, 3.5–3.85 mm; length of head and nasus, 1.7 mm; length of head without nasus, 1 mm; length of nasus, 0.7 mm; length of pronotum, 0.2 mm; length of hind tibia, 1.2 mm; width of head (where widest). 1 mm; width of pronotum, 0.5 mm.

Worker: Postclypeus nearly three times as wide as long.

*Type locality.*—Rangirum, Darjeeling, Bengal, India.

*Cotypes.*—Soldiers, tube 25, in British Museum; Forest Research Institute, Dehra Dun, United Provinces, India; and U.S.N.M. No. 44579.

*Remarks.*—Described from a series of soldiers collected with workers in rotten wood at an elevation of 6,000 feet by J. C. M. Gardner, 6, IX, 1929.

MICROCEROTERMES BEESONI, new species

FIGURE 7

*Description.*—Winged adult: Head dark castaneous-brown, with dense, fairly long hairs. Eye black, not round, separated from lower margin of head by a distance less than its diameter. Ocellus white, small, oval, separated from the eye by a distance about equal to the

long diameter of an ocellus. Fontanelle not visible, or a small point at the convergence of two lines from the ocelli to the apex of the head, that is, the outlines of the epicranial suture. Postclypeus lighter colored than head, large, raised, divided medially, twice as wide as long, wider than in *heimi* Wasmann. Antennae with 14 segments, third segment shorter than second or fourth. Pronotum of about same color as head, anterior margin straight, posterior margin nearly straight, with long bristles. Mesonotum and metanotum usually plainly emarginate, but variable. Wings dark, tissue punctate and with fairly dense hairs. In fore wing the median vein leaves the stub free and runs nearer to the cubitus than to the subcosta and is single or branched near apex of wing. Cubitus with nine branches to lower margin, of which the first five are thickened, but variable. Tibiae brownish. Abdomen lighter colored than head, tergites with dense hairs and a row of long bristles at base of each tergite.

*Measurements.*—Length of entire winged adult, 7.75–8.5 mm; length of dealated adult, 5–6 mm; length of head (to tip of labrum), 1.05–1.1 mm; length of pronotum, 0.4 mm; length of fore wing, 6.8 mm; length of hind tibia, 0.8 mm; long diameter of eye, 0.2 mm; width of head (at eyes), 0.8–

0.85 mm; width of pronotum, 0.65–0.7 mm; width of fore wing, 1.7 mm.

*Type locality.*—Chakata Range, Haldwani, United Provinces, India.

*Cotypes.*—Winged adults, tube 21, British Museum; in Forest Research Institute, Dehra Dun, United Provinces, India, and U. S. N. M. No. 44106.

*Remarks.*—Head darker colored, ocelli larger, oval, and closer to eyes than in *heimi*, where they are round and more distant from eyes. Smaller than *annandalei* Silvestri. This may be the winged form of a termite described from the soldier caste alone.

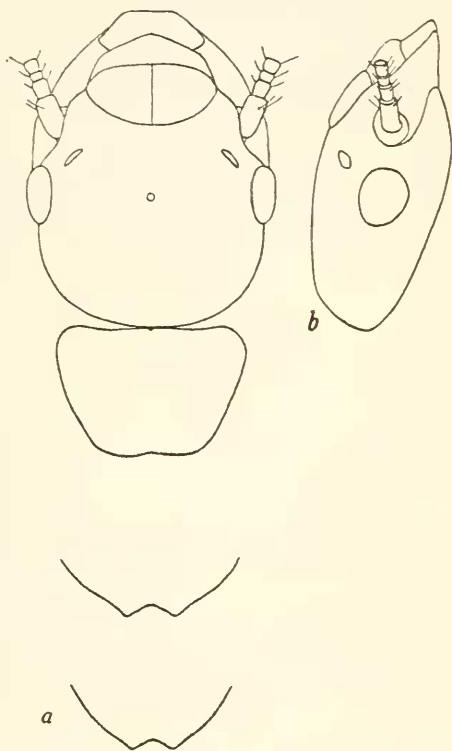


FIGURE 7.—*Microcerotermes becconi*, new species: a, Dorsal view of head, pronotum, mesonotum, and metanotum; b, lateral view of head. Winged adult.  $\times 40$



Described from a series of winged adults collected on the wing at the type locality by S. V. Chatterjee, VII, 1930. Named for C. F. C. Beeson, forest entomologist, Forest Research Institute, Dehra Dun, India.

**MICROCEROTERMES CHAMPIONI, new species**

FIGURE 8

*Description.*—Winged adult: Head dark castaneous-brown, with fairly dense short hairs and longer bristles. Eyes black, nearly round, separated from lateral margin of head by a distance less than their diameter. Ocelli white, fairly large, oval, separated from eyes by a distance less than the long diameter of an ocellus. Fontanelle not visible, or a raised white spot at the convergence of two lines from the ocelli to apex of head, or the outlines of the epicranial suture. Postclypeus lighter colored than head, raised up, with a median line, about twice as broad as long—broader than in *heimi* Wasmann. Antennae with 14 segments, third segment smaller than fourth, second as long as third and fourth. Pronotum of same color and with same pubescence as head, posterior margin nearly straight. Mesonotum and metanotum slightly emarginate posteriorly. Wing smoky gray, margins white, tissue densely punctate, and with

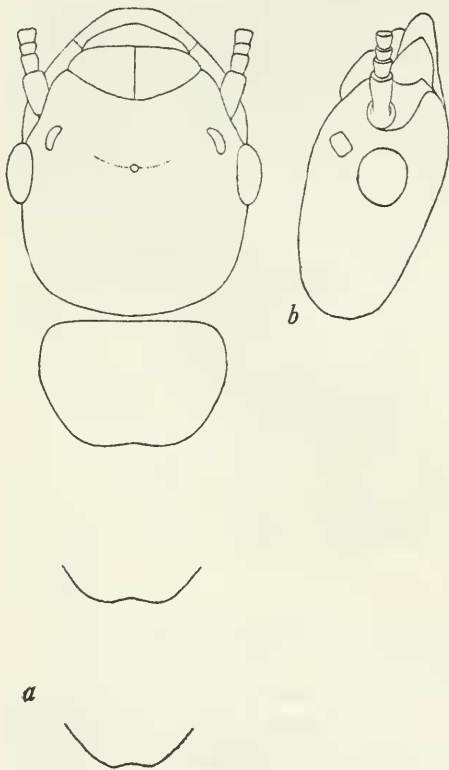


FIGURE 8.—*Microcerotermes championi*, new species: *a*, Dorsal view of head, pronotum, mesonotum, and metanotum; *b*, lateral view of head. Winged adult.  $\times 40$

fairly dense hairs. In fore wing, median vein closer to cubitus than to subcosta, branched to apex; cubitus with 10 branches to lower margin, 8 of which are thickened. Tibiae yellow-brown. Abdomen lighter colored than head, with dense hairs and a row of longer bristles at the base of each tergite.

Ocelli slightly larger than in *beesoni*; eyes slightly smaller, pronotum long. Ocelli larger than in *heimi* Wasmann, closer to eyes, head and postclypeus darker colored, pronotum longer, tibia lighter

colored. Compared with cotype material. Smaller than *annandalei* Silvestri.

*Measurements*.—Length of entire winged adult, 7.5–8.5 mm; length of dealated adult, 4.8–5 mm; length of head (to tip of labrum), 1.1 mm; length of pronotum, 0.4–0.45 mm; length of fore wing, 6.25 mm; length of hind tibia, 0.85 mm; long diameter of eye, 0.175 mm; width of head (at eyes), 0.82 mm; width of pronotum, 0.6 mm; width of fore wing, 1.5 mm.

*Soldier*.—Head light yellow-brown to darker, with few hairs. Antennae with 13 segments, third as in *heimi*. Pronotum with anterior margin notched in middle, posteriorly nearly straight. Abdomen with fairly dense hairs and a row of longer hairs at the base of each tergite.

*Measurements*.—Length of entire soldier, 4.5 mm; length of head and mandibles, 2.2–2.3 mm; length of head without mandibles, 1.4–1.5 mm; length of left mandible, 0.8 mm; length of pronotum, 0.3 mm; length of hind tibia, 0.65 mm; width of head, 0.9 mm; width of pronotum, 0.55 mm.

*Type locality*.—Haldwani district, Kumaon, United Provinces, India.

*Cotypes*.—Winged adults, U.S.N.M. No. 44107. Comorphotypes, soldiers, United States National Museum. Both cotypes and comorphotypes in British Museum and Forest Research Institute, Dehra Dun, United Provinces, India.

*Remarks*.—Very close to *heimi*, darker colored, pronotum more distinctly notched in middle anteriorly, gula narrower in middle; soldier larger than that of *greeni* Holmgren.

Described from a series of winged adults collected with soldiers, workers, and 11 physogastric, macropterous queens at the type locality, 14, 6, 23, by H. G. Champion, for whom this termite is named.